REMARKS

Claims 1-16 are pending. Claim 1 has been amended. Claim 17 has been cancelled. Reconsideration and allowance of the present application based on the following remarks are respectfully requested.

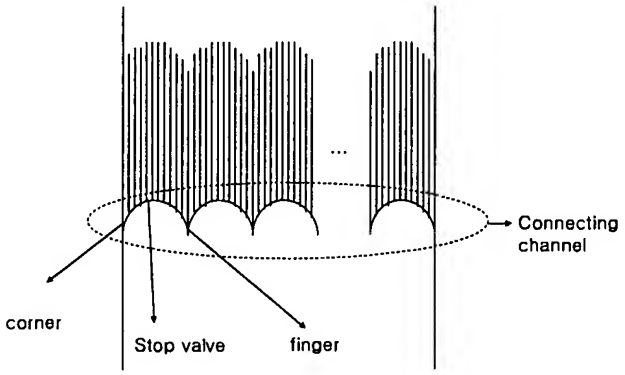
Entry of this Amendment is respectfully requested since no new issues are raised by the Amendment and it places the Application in condition for allowance, or at least in better form for appeal.

Claim Rejections Under 35 U.S.C. § 102

Claims 1-8 and 11-16 were rejected under 35 U.S.C. § 102(b) over Buechler (U.S. Patent No.6,271,040). Applicants respectfully traverse this rejection.

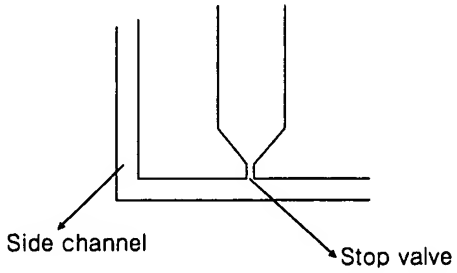
Amended claim 1 recites, in part, a device for controlling fluid using surface tension of the fluid, that includes at least one side connecting channel which connects at least two stop valves; wherein the stop valves stop the flow of the fluid using the surface tension of the fluid and the flow through the connecting channel opens the stop valve.

Applicants submit that Buechler fails to teach or suggest at least this feature of claim 1. Specifically, In Buechler, the part composed of several fingers (the dotted part in the figure below), is what the Examiner appears to allege are analagous to the connecting channel recited in claim 1, considered as the connecting channel (this is the part that is composed of micro connecting channel, not separated). As liquid moves to the connecting channel, it stops at the stop valve (the vertical hem of the connecting channel). The stop valve is removed as low capillary forces (or low pressure in a capillary tube (capillarity)) are formed by the liquid moved to the finger or corner.



The Buechler Reference

However, in the present invention, the side channel is formed independently (as shown in the Figure below, and it is the channel where liquid actually flows through, and at the same time, it carries out the role of the time delay valve (the stop valve is activated when the liquid flows passing by this part). First, the liquid stops at the stop valve, and the liquid that is moving to the side channel meets the interface of the stopped liquid near the stop valve, and this is how the stop valve is removed. Therefore, in the present invention, unlike in Buechler, the flow of fluid through the side channel opens the stop valve.

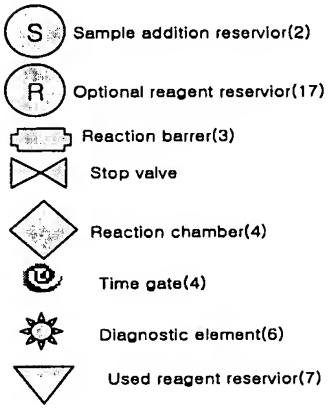


The Present Invention

Buechler fails to teach or even suggest such a feature since Buechler relies on the fingers at the ends of the stop valves to control the flow through the channel.

Additionally, in Buechler, the purpose of the reaction chamber is to mix and cause sample and reagents to react, delay time by using the time gate while they are mixed and react, and use the reaction barrier in order to prevent sample from expanding. In the present invention, the sample previously flown in is mixed with the materials fixed in the reaction chamber, reaction occurs, and time is delayed while the above is occurring. The Examiner mentioned that fluid in the reaction chamber naturally gets exchanged as it flows to the waste chamber in the cited reference. However, the same fluid previously flown into the reaction chamber, not the third fluid which is different, is entered in. The present invention is different in that, after the reaction takes place, the third liquid, which is different, is flown into the reaction chamber. Especially, in the washing process which is necessary for biochemistry reactions, the need for replacing with the wash liquid, which is the third liquid, arises. In the present invention, after reaction takes place in the reaction chamber (reaction with the bead existing in the chamber or reaction with sample at the surface electrode), it can be very efficient in using it to remove residual materials of reaction (especially, the non-outsanding reagents) with wash liquid.

As can be seen from the drawings below, the Buechler structure in which a sample enters into the reaction chamber gets filled up with a sample again and is withdrawn from the structure (Fig. 1, 1A); the structure in which a sample is mixed with reagents before it enters into the reaction chamber, and after it enters gets filled again with the two mixtures (1B, 1C); and the structure in which it is mixed outside beforehand and then it enters (Fig. 2).



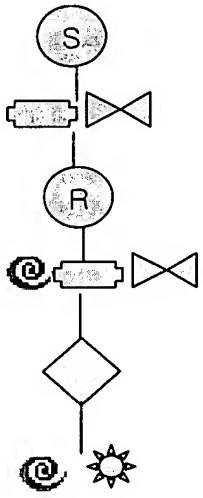


FIG. 1

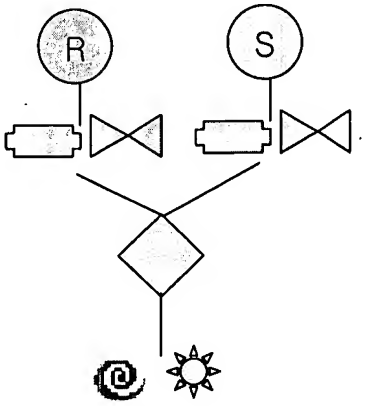


FIG. 1A

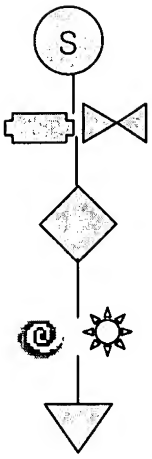


FIG. 1B

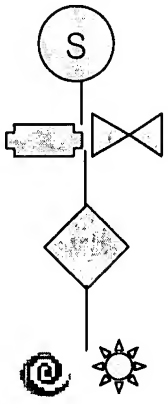


FIG. 1C

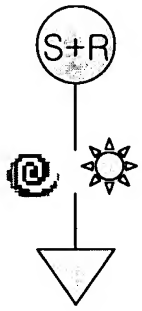


FIG. 2

In other words, in the reaction chamber, no change for new liquid takes place. Therefore, in the present invention, the fact that new liquid has been proposed is clearly different from others and has advantages.

Accordingly, Buechler fails to teach, or even suggest, a device for controlling fluid using surface tension of the fluid, that includes at least one side connecting channel which connects at least two stop valves; wherein the stop valves stop the flow of the fluid using the surface tension of the fluid and the flow through the connecting channel opens the stop valve, as recited in claim 1.

Claims 2-8 and 11-16 are believed allowable for at least the same reasons presented above with respect to claim 1 by virtue of their dependence upon claim 1. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Claim Rejections Under 35 U.S.C. § 103

Claims 9 and 10 were rejected under 35 U.S.C. § 103(a) over Buechler. Applicants respectfully traverse this rejection.

Claims 9 and 10 are believed allowable for at least the same reasons presented above with respect to claim 1 by virtue of their dependence upon claim 1 and because Buechler does not teach or suggest at least the subject matter of claim 1. Accordingly, Applicants respectfully request reconsideration and withdrawal of this rejection.

Conclusion

Therefore, all objections and rejections having been addressed, it is respectfully submitted that the present application is in a condition for allowance and a Notice to that effect is earnestly solicited.

Should any issues remain unresolved, the Examiner is encouraged to contact the undersigned attorney for Applicants at the telephone number indicated below in order to expeditiously resolve any remaining issues.

Respectfully submitted,

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